ARTICLE 10
EVALUATION OF ELEMENTS THAT ARE NOT PART OF THE LATERAL FORCE RESISTING SYSTEM

10.0 INTRODUCTION

This article sets forth general requirements that apply to nonstructural elements, related to life-safety issues. Article 11 addresses evaluation of critical nonstructural systems need for continued hospital function following an earthquake, and assignment of buildings to Nonstructural Performance Categories.

The evaluation statements discussed in this article (and listed in the Appendix) deal with life-safety concerns. Some of the statements can be answered directly. For others, further investigation will be required in accordance with evaluation procedures indicated in other articles of these regulations using seismic forces indicated in Sec. 2.4.6 and the appropriate C_c seismic coefficient given in Table 2.4.3.1. Also, the materials used in the nonstructural element and its connections must be considered.

10.1 NONSTRUCTURAL WALLS

The term "nonstructural walls" refers to walls that are not part of the load carrying system, but may become load bearing upon attachment and interaction with other elements. Evaluation must be made to determine if they are capable of resisting seismic forces required by Sec. 2.4.6 as well as the other requirements of these regulations.

10.1.1 PARTITIONS:

10.1.1.1 MASONRY PARTITIONS: There are no unbraced, unreinforced masonry or hollow clay tile partitions in critical care areas, clinical laboratory service spaces, pharmaceutical service spaces, radiological service spaces, and central and sterile supply areas, exit corridors, elevator shafts, or stairwells.
For conforming buildings, the evaluator may consider this condition as mitigated, and no calculations are necessary. Check for the presence of support angles at floor and roof, and for spaces at the sides and top of the wall to provide for interaction of the structural system.

10.1.1.2 STRUCTURAL SEPARATIONS: At structural separations, partitions in exit corridors have seismic or control joints.
Check that seismic and/or control joints have been provided at structural separations. Conforming buildings that fail this check shall be placed in SPC 4.

10.1.1.3 PARTITION BRACING: In exit corridors, the tops of partitions that only extend to the ceiling line have lateral bracing.
For conforming buildings, the evaluator may consider this condition as mitigated, and no calculations are necessary. Partitions extending only to ceilings may overturn or buckle due to the lack of bracing.

10.1.2 CLADDING AND VENEER:
For conforming buildings, the evaluator may consider these conditions as mitigated, and no calculations are necessary. Exterior wall panels or cladding can fall if their connections to the building frames have insufficient strength and/or ductility.

10.1.2.1 MASONRY VENEER: Masonry veneer is connected to the back-up with corrosion-resistant ties spaced 24 inches on center maximum with at least one tie for every 2-2/3 square feet.
For conforming buildings, the evaluator may consider this condition as mitigated, and no calculations are necessary. Check for the presence of the required ties.

10.1.2.2 CLADDING PANELS IN MOMENT FRAME BUILDINGS: For moment frame buildings of steel or concrete, panels are isolated from the structural frame to absorb predicted inter-story drift without collapse.
For conforming buildings, the evaluator may consider this condition as mitigated, and no calculations are necessary. Check the ability of the cladding panels and their connections to tolerate the story drift computed in Section 2.4.4 with out an anchorage failure.

10.1.2.3 CLADDING PANEL CONNECTIONS: Where bearing connections are required, there are at least two bearing connections for each cladding panel, and there are at least four connections for each cladding panel capable of resisting out-of-plane forces.
For conforming buildings, the evaluator may consider this condition as mitigated, and no calculations are necessary. Verify that an adequate number of the appropriate connection types are present for each cladding panel.

10.1.2.4 CLADDING PANEL CONDITION: Cladding panel connections appear to be installed properly. No connection element is severely deteriorated or corroded. There is no cracking in the panel materials indicative of substantial structural distress. There is no substantial damage to exterior cladding due to water leakage. There is no substantial damage to exterior wall cladding due to temperature movements.
Substantial deterioration can lead to loss of cladding elements or panels. Exterior walls shall be checked for deterioration. Damage due to corrosion, rotting, freezing, or erosion can be concealed within wall. Probe into the wall space if necessary, for signs of water leakage at vulnerable interior spaces (e.g., around windows and at floor areas). Check elements that tie cladding to the back-up structure and that tie the back-up structure to floor and roof slabs. Check exterior walls for cracking due to thermal movements. Check the cladding systems with appropriate reductions in member capacities. Conforming buildings that fail this check shall be placed in SPC 4.

10.1.3 METAL STUD BACK-UP SYSTEMS

10.1.3.1 METAL STUD BACK-UP SYSTEMS, GENERAL: Additional steel studs frame window and door openings. Corrosion of veneer ties, tie screws, studs, and stud tracks is minimal. Stud tracks are adequately fastened to the structural frame.
For conforming buildings, the evaluator may consider this condition as mitigated, and no calculations are necessary. Verify that adequate framing has been provided around openings in the exterior walls. Check the cladding systems with appropriate reductions in member capacities. Check the adequacy of the connection to the structural frame using the forces specified in Section 2.4.6.

10.1.3.2 MASONRY VENEER WITH STUD BACK-UP: Masonry veneer more than 30 feet above the ground is supported by shelf angles or other elements at each floor level. Masonry veneer is adequately anchored to the back-up at locations of through-wall flashing. Masonry veneer is connected to the back-up with corrosion-resistant ties spaced 24 inches on center maximum and with at least one tie for every 2-2/3 square feet.
For conforming buildings, the evaluator may consider this condition as mitigated, and no calculations are necessary. Check that adequate supports and ties are provided.

10.1.4 MASONRY VENEER WITH CONCRETE BLOCK BACK-UP

10.1.4.1 MASONRY VENEER WITH CONCRETE BLOCK BACK-UP, GENERAL: The concrete block back-up qualifies as reinforced masonry
For conforming buildings, the evaluator may consider this condition as mitigated, and no calculations are necessary. Verify that the concrete block back-up meets the requirements of Sections 5.3.2 and 5.3.3.

10.1.4.2 MASONRY VENEER SUPPORT: Masonry veneer more than 30 feet above the ground is supported by shelf angles or other elements at each floor level. Masonry veneer is adequately anchored to the back-up at locations of through-wall flashing. Masonry veneer is connected to the back-up with corrosion-resistant ties spaced 24 inches on center maximum and with at least one tie for every 2-2/3 square feet. The concrete block back-up is positively anchored to the structural frame at 4 feet maximum intervals along the floors and roofs.
For conforming buildings, the evaluator may consider this condition as mitigated, and no calculations are necessary. Check that adequate supports and ties are provided.

10.1.5 OTHER VENEER/PANEL SYSTEMS

10.1.5.1 THIN STONE VENEER PANELS: Stone anchorages are adequate for computed loads.
For conforming buildings, the evaluator may consider this condition as mitigated, and no calculations are necessary. There are no visible cracks or weak veins in the stone. Check the adequacy of the connection to the stone anchorage using the forces specified in Section 2.4.6.

10.1.5.2 WOOD/AGGREGATE PANELS: There is no visible deterioration of screws or wood at panel attachment points.
The deficiency is in the strength of the connections. Determine the cause and extent of distress and check the attachment of the panels with appropriate reductions in capacity. Conforming buildings that fail this check shall be placed in SPC 4.

10.1.6 PARAPETS, CORNICES, ORNAMENTATION, AND APPENDAGES: There are no laterally unsupported unreinforced masonry parapets or cornices above the highest anchorage level with height/thickness ratios greater than 1.5. Concrete parapets with height/thickness ratios greater than 1.5 have vertical reinforcement. Cornices, parapets, signs, and other appendages that extend above the highest anchorage level or cantilever from exterior wall faces and other exterior wall ornamentation are reinforced and well anchored to the structural system.
For conforming buildings, the evaluator may consider this condition as mitigated, and no calculations are necessary. If any of these items are of insufficient strength and/or are not securely attached to the structural elements, they may break off and fall, becoming significant life-safety hazards. Check the adequacy of these items using the forces specified in Section 2.4.6.

10.1.7 MEANS OF EGRESS: Canopies are anchored and braced to prevent collapse and blockage of building exits. For conforming buildings, the evaluator may consider this condition as mitigated, and no calculations are necessary. Check canopies for the forces specified in Section 2.4.6.